SCREENING OF GOAT FLOCKS FOR BRUCELLOSIS USING ROSE BENGAL PLATE TEST

Muhammad Aslam Mirza, Muhammad Ajmal Jalvi and Abdul Razzak
Sheep and Goat Development Centre, Rakh Khairewala, District Layyah, Pakistan

ABSTRACT

One thousand six hundred and thirteen (1613) goats of Beetal, Teddy, Daira Din Panah (DDP), Nachi and Angora breeds from five Livestock Experiment Stations (LES) were tested for brucellosis using a serological technique (RBPT). The overall prevalence of brucellosis was observed to be 8.6 per cent. The flocks at LES, Rakh Khairewala showed the highest prevalence of brucellosis (13.5%). Overall the dose showed maximum incidence of brucellosis in all breeds and the highest prevalence was observed in goats of exotic origin (Angora and Teddy).

INTRODUCTION

Brucellosis is a classical zoonotic disease and is one of the leading causes of abortion and sterility in all classes of domesticated livestock. Because the presence of this disease in sheep and goats is a source of great economic loss and a constant threat to human health. *Brucella melitensis* (Corbel, 1989) which infects sheep and goats is more virulent for man than other species of genus Brucella (Madkhour, 1990). A regular screening of flocks for brucellosis helps herdsman to monitor and cull the infected animals. The present study was thus designed to report the screening of goat flocks for brucellosis at various livestock farms run by Livestock and Dairy Development Department, Government of the Punjab.

MATERIALS AND METHODS

Animals

All the goat flocks maintained at five Livestock Experimental Stations (LES) in Punjab viz. Rakh Khairewala, Chak Katora, Fazilpur, Alladad and Rakh Ghulaman, were tested for brucellosis using a standard serological technique (Rose Bengal Plate Test) during 1994-95. Both the sexes having above six months age were included in this study. Blood samples without anticoagulant were collected aseptically from each animal. The serum was separated and stored at -20°C till analysis.

Antigen

The screening of sera for this study was carried out using the antigen procured from Veterinary Research Institute, Lahore. The antigen and serum samples, prior to use, were brought at room temperature.

Rose Bengal Plate Test (RBPT)

Rose-Bangal Plate Test was performed on a clean microscope glass slide by mixing a drop of test serum with a drop of Rose-Bengal antigen. Samples giving complete agglutination with the specified time were considered positive and those that gave partial agglutination were considered doubtful and those without agglutination were considered negative.

RESULTS AND DISCUSSION

Overall prevalence of brucellosis in goat flocks at five livestock farms was observed to be 8.6 per cent with the highest involvement of female population (9.3%) as against 5.3 per cent in male population (Table 1). The prevalence of brucellosis observed in this study closely corresponds to that of Ahmad (1993) who reported the prevalence of brucellosis in small ruminants at Government Farms to be 9 per cent and those of Masoumi *et al.* (1992) who reported higher incidence of brucellosis in female goats than in male goats.

Farm-wise seroprevalence was highest at LES, Rakh Khairewala (13.5%) followed by Chak Katora (7.5%), Fazilpur (3.7%), Allahdad (1.4%) and Rakh Ghulaman (1.3%). One possible reason for such a high prevalence of brucellosis at Khairewala could be the greater size of goat population maintained at farm which facilitates contamination of farm premises thereby resulting in more horizontal transfer of infection. Salmon *et al.* (1984) also linked the higher rates of brucellosis with size of farm. In the present screening, the prevalence of brucellosis at various farms was observed to be directly proportional to the number of animals maintained at that farm (Table 1). The animals get the infection via the nasopharynx largely through ingestion of contaminated

Table 1: Seroprevalence of brucellosis in different breeds of goats maintained at Livestock Farms in Punjab

Breed	Sex	Animals tested for brucellosis	Positive animals No. (%)
LES, Rakh Khairewala			
Beetal	Male	24	2(9.2)
	Female	200	16(8.0)
	Total	224	18(8.0)
Teddy	Male	26	7(26.9)
	Female	96	27(28.1)
	Total	122	34(27.8)
DDP	Male	11	-
	Female	46	5(4.8)
	Total	57	5(8.8)
Nachi	Male	13	-
	Female	62	3(4.8)
	Total	75	3(4.0)
Angora	Male	25	1(4.0)
	Female	280	45(16.0)
	Total	305	46(15.0)
Overall	Male	99	10(10.1)
	Female	684	96(14.0)
	Total	783	106(13.5)
Rakh Ghulaman			
Teddy	Male	63	1(1.6)
	Female	196	2(1.2)
	Total	232	3(1.3)
Fazilpur			
Angora	Male	8	-
	Female	155	6(3.9)
	Total	163	6(3.7)
Allahdad			
Beetal	Male	16	-
	Female	124	2(1.6)
	Total	140	2(1.4)
Chak Katora			
Teddy	Male	97	4(4.1)
	Female	198	18(9.1)
	Total	295	22(7.5)
Overall of all farms	Male	281	15(5.3)
	Female	1330	124(9.3)
	Total	1611	139(8.6)

Figures in parenthesis represent percentage

Table 2: Seroprevalence of brucellosis in different classes of goats

Breed	Sex	Animals tested for brucellosis	Positive animals No. (%)
Rakh Khairewala			
Beetal	Buck	5	2(10.5)
	MYS	19	12(9.8)
	Doe	122	12(9.8)
	FYS	78	4(5.1)
Teddy	Buck	5	1(20.0)
	MYS	21	6(28.0)
	Doe	67	21(31.3)
	FYS	29	6(20.7)
DDP	Buck	3	-
	MYS	8	-
	Doe	34	5(14.7)
	EYS	12	-
Nachi	Buck	3	-
	MYS	10	-
	Doe	226	40(19.4)
	FYS	74	5(6.8)
Angora	Buck	9	1(11.1)
	NYS	16	1(1.6)
	Doe	146	2(1.4)
	FYS	23	-
Fazilpur			
Angora	Buck	5	-
	MYS	3	-
	Doe	125	4(3.2)
	FYS	30	2(6.7)
Allahdad			
Beetal	Buck	4	-
	MYS	12	-
	Doe	49	-
	FYS	75	2(27)
Chak Katora			
Teddy	Buck	8	-
	MYS	89	4(4.5)
	Doe	129	12(9.3)
	FYS	69	6(18.7)

MYS= Male Young Stock, FYS= Female Young Stock

vaginal discharges, water and feed. Once the bacteria invade the uterus they rapidly multiply leading to an infected birth with or without abortion (Nicoletti, 1989). The infection persists in the uterus during pregnancy and subsequently spreads to other animals through the contaminated environment. Obviously, greater number of animals provide greater chances of premises contamination and thus greater susceptibility to infection. It is worth mentioning that excretion of *Br. melitensis* from the vagina is more prolonged than in

cows affected with *Br. abortus* and lasts up to 2-3 months in goats (Nicoletti, 1989).

Overall breed-wise data on seroprevalence of brucellosis demonstrated the highest prevalence in Angora breed (11.1%) followed by Teddy (9.2%), DDP (8.8%), Beetal (5.2%) and Nachi (4.0%) breeds. When breed-wise prevalence was compiled, at LES Khairewala, the prevalence of brucellosis in Teddy goats was observed to be considerably high (27.8%) followed by Angora (15.0%), DDP (8.8%), Beetal (8.0%) and Nachi (4.0%) (Table 2). In contrast, the incidence of brucellosis in Angora and Teddy goats maintained at other farms was not that high which rules out breed susceptibility.

The dose showed the highest incidence of brucellosis in all breeds of goats (Table 2). In D.D.P and Nachi breeds only dose were observed to be infected. A similar observation was noted for LES, Khairewala where the prevalence of brucellosis was highest among does population compared with that of other classes particularly in Teddy and Angora breeds.

Care must be taken in the interpretation of data obtained as all brucella infected animals will not show diagnostically significant titre and all seronegative animals may not be declared free from infection since the test is specific and depends on the stage of infection (AI-Delaimi and Ali, 1990). However, the animals which repeatedly gave negative serological results could be assumed free from infection (Anonymous, 1977).

This was a large scale screening of sera and in such cases the RBPT is an excellent tool and is the recommended method (Blood and Radostitis, 1989). The test has been widely employed in many successful National Brucellosis Eradication Porogrammes (Boargob and Muhammad, 1989). There are certain points that must be kept in mind while carrying out RBPT. The workers get a small percentage of false-positive that may be observed due to residual antibody activity from cross reaction with certain bacteria and colostral antibodies. Moreover, vaccination often influences the findings. Therefore, where the animals are to be discarded or where a tight treatment regimen adopted, the sera must be submitted to more definite tests for confirmation.

ACKNOWLEDGEMENTS

Supply of *Brucella abortus* antigen for the Rose-Bengal Plate Test by VRI, Lahore is gratefully acknowledged. The help of Mr. Ghulam Rasool and Mr. M. Aslam, Laboratory Technicians of this centre is also acknowledged.

REFERENCES

Ahmad, R., 1993. Epidemiological investigations of brucellosis in animals. 14th Annual Report, Livestock Production Research Institute, Bahadar Nagar, Okara, Pakistan, pp: 112.

Al-Delaimi, A.D. and A.H. Ali, 1990. A study on epidemic abortions associated with brucellosis in sheep. Pakistan Vet. J., 10: 1-4

Anonymous, 1977. Brucellosis: an evaluation. A report of the Subcommittee on Brucellosis. Research Committee on Animal Health, Board on Agriculture and Renewable Resources. National Research Council, National Academy of Sciences, Washington D.C., pp: 99-137.

Blood, D.C. and O.M. Radostitis, 1989. A Textbook of the Diseases of Cattle, Sheep Pigs, goats and Horses. ELBS, London, pp: 681

Boargob, A and S.I. Muhammad, 1989. The prevalence of brucellosis in some sheep and goat flocks in the western mountains of Libya. Bull. Anim. Hlth. and Prod. Africa, 37: 9-12.

Buxton A. and G. Fraser, 1977. Animal Microbiology. Blackwell Scientific Publications, Oxford, pp: 357.

Carbel, M.J., 1989 Microbiological aspects. In Brucellosis. Madkour M.M. Butterworths, pp: 29-44.

Madkour, M.M., 1989. Historical aspects of brucellosis. In Brucellosis. Madkour M.M. (ed): Butterwarths. pp: 1-10.

Masoumi, J.P., M.A. Sheikh, R. Ahmad M. Naseem, M. Ahmad and I. Hussain 1992. Seroprevalence of brucellosis in sheep, goats and man in Lahore area. Indian J. Dairy Sci., 45: 298-299.

Nicoletti, P., 1989. Brucellosis in animals. In Brucellosis. Madkour M.M. (ed): Butterworths, pp: 251-262.

Stableforth, A.W., 1959. Brucellosis. Infectious Diseases of Animals, Vol. 1 A.W. Stableforth & J.A Galloway (ed) Butterworths, pp: 53-159.

Salman, M.D., M.E. Meyer and J.C. Cramer, 1984. Epidemiology of bovine brucellosis in the Maxicali Valley. Mexico. Am. J. Vet. Res., 45: 1567-1571.